Volunteer Firemen

Professional Journal of the Volunteer Firemen's Section of the National Fire Protection Association

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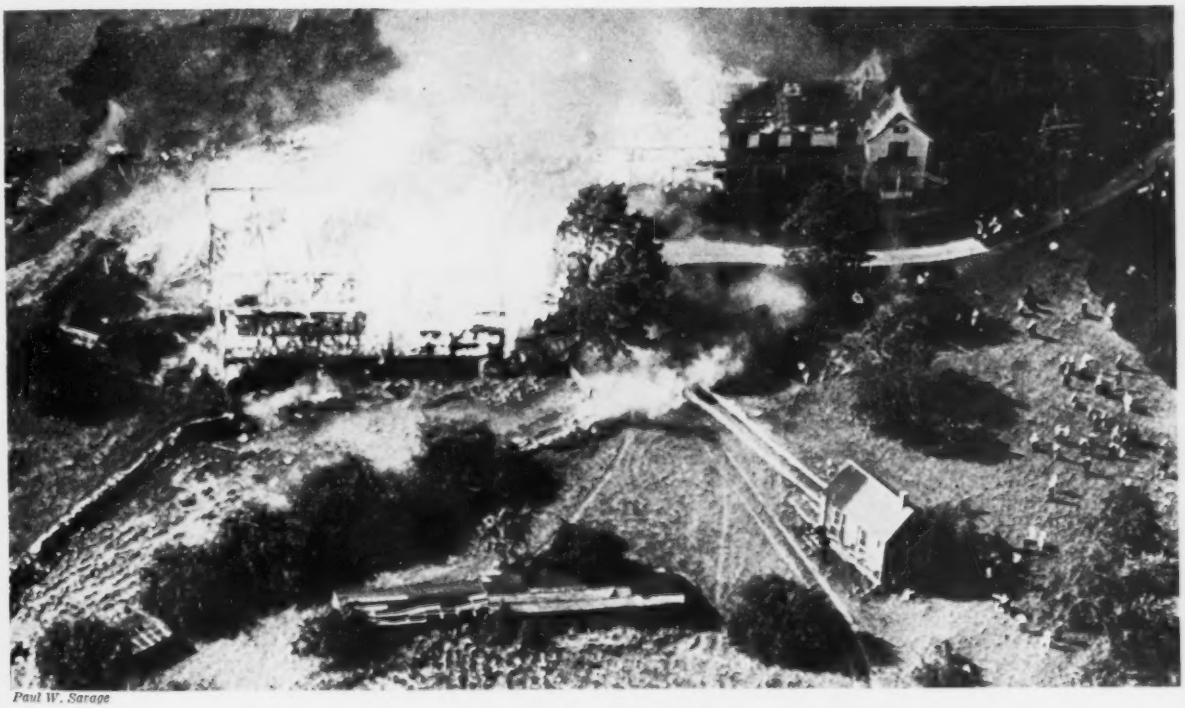

Paul W. Savage

Spontaneous Ignition

Cause of Many Serious Barn Fires Is Still Pretty Much a Riddle to Experts

SPONTANEOUS "combustion," more accurately termed spontaneous *ignition*, has long been known to be responsible for many serious fires on farms. There is hardly a volunteer fireman whose experience dates very far back who has not at some time or other been at a fire in a barn, for which there did not seem to be any obvious cause and which had to be put down to spontaneous ignition. The fire shown in the picture above is one of these mysterious fires due to spontaneous ignition of the hay in the barn. Since there was no water in an amount sufficient for the fire apparatus available, the fire of course spread to the house with the resulting disastrous spectacle.

Probably $30,000,000 of the farm fire loss in the United States alone each year is attributable to the phenomenon of the apparent self-heating of hay and other farm products. The experts of the U. S. Department of Agriculture give that estimate, and they should know as they have been investigating the problem for several years. Canadian authorities also have been busy. The Fire Marshal's Department of the Province of Ontario did one of the finest pieces of practical research which has been done in the field when it carefully investigated the circumstances of over 400 actual spontaneous ignition fires a few years ago. All the governmental and private agencies available for research on spontaneous ignition are coördinating their efforts to find out more about the subject through the N.F.P.A. Committee on Spontaneous Heating and Ignition.

While spontaneous ignition itself is still pretty much of a riddle to scientists,

How fire sometimes travels against the wind. There is no contact of flame here, yet radiated heat has ignited the wooden walls of the adjacent dwelling. Thus does fire extend its invisible hand and the single fire becomes a sweeping conflagration.

some practical methods of preventing its development in piles of hay and other farm products stored in barns are recommended. Damp or uncured hay, pea vines and other roughage are known to heat up when stacked in piles, and so if these fires are to be avoided, these materials must be thoroughly cured before storing. Horse manure frequently behaves the same way and so should not be allowed to accumulate in large piles in stables or against buildings.

Unusual Handling of a Barn Fire

THE Warwick, N. Y., Volunteer Fire Department responded one day to a call which came as the result of fire being discovered in the haymow of a nearby farm.

After the department had extinguished the fire with the use of as little water as possible, the owner set his farm hands to work with hay knives and they cut out the damaged section of hay to remove the charred and wet stock.

When they had cut down far enough, they found that there was a four foot depth of pure ashes, indicating that the fire had been in progress for some time before discovery.

A Fire Fighting Story Which Shows How Not to Do It

THE following is a true account of what occurred at a fire in a merchandising establishment in October 1933 in a town of approximately 15,000 population. The name of the town is not mentioned herein for obvious reasons. The establishment consisted of a group of brick buildings to which was attached a three-story and basement sprinklered building. A small fire started in the paper baling room in the basement under the waste paper chute, and was discovered by the plant watchman at about 4 o'clock in the morning. He telephoned the fire department which was located within 500 feet of the buildings.

The fire department had a 600-gallon triple combination pumper, a city service ladder truck, a 750-gallon triple combination pumper and a chemical and hose wagon. The department consisted of sixteen paid men and the Chief on a two-platoon basis. The Chief and six men and the 600-gallon pumper responded to the fire promptly. The pumper crew immediately started to drag out the 2½-inch hose but were ordered by the Chief to use a booster line. The apparatus backed up from the hydrant to the office entrance, but the Captain, noticing a glow of fire in the basement, ordered the driver to draw up to the hydrant again and use the large hose. He was again ordered by the Chief to back up to the office entrance and use the booster line, in spite of his protest.

The Captain then took the booster line to the second floor. There was a delay of several minutes in getting water due to the fact that one valve stuck and time was also used up in starting the pump, and opening suction valves, and valves to the booster lines. The flames steadily increased during the delay and the booster line could only be used for a few minutes before the men had to carry it back downstairs and report to the Chief that the fire was mainly in the basement. The crew was ordered to reel in booster line before proceeding to use the line of hose. This caused a further delay.

The water supply for hydrants in the vicinity of the fire came from a direct pumping system, with a 10-in. main and 6-in. main in front of the buildings and a good gridiron of 6-in. and 4-in. mains in the vicinity. For fire service, a one million gallon reservoir affording 125 pounds pressure at this point was maintained in reserve. The control valve on the 10-in. main of this reservoir was only two blocks from the seat of the fire. The first large stream was put through a small window in the basement but the water bounced back due to a wooden partition. The flames meanwhile were pouring into the second floor. The plate glass store windows on the first floor were then broken and a stream directed into the store.

The second hydrant stream was directed at the second floor windows from the street level. Not a ladder was raised. No fireman attempted to go into the building on the first floor to find the waste paper chute. Cellar nozzles and spray nozzles were part of the equipment but were not used until later. A smoke helmet was also part of the equipment but no member of the department entered the building.

It was now about 4:35 A.M. At about this time bystanders informed the Chief that fire was breaking out at the rear of the building, testimony indicating that the Chief had made no investigation of conditions at the rear and was directing all efforts at pouring water into the front of the building. The draft of water for the several hose streams was causing reduction of pressures such that the streams were becoming more and more inefficient although several firemen had reminded the Chief to turn on the fire reservoir. No one apparently thought of using the two pumpers. Fire meanwhile was spreading through the two-story building and brands were falling on the roof of the three-story building. The fire doors at the cut-off between the buildings evidently worked and were closed and there is every evidence that the three-story building burned down from the top. The owners of the property asked to have the fire reservoir turned on but without result. They also asked to have assistance called from a neighboring town but were told that no assistance was needed.

At about 5 o'clock when it was evident that the fire was getting out of control, the owners called to the neighboring town for assistance which arrived about 5:30 A.M. The out of town apparatus consisted of a 1,000-gallon pumper with a Chief and four men. This was assigned to a hydrant and the company was told not to use the pumper although streams from the hydrant were ineffective. The new company immediately brought lad-

ders into play, however, went to the roof of a nearby building and prevented ignition of this roof.

The fire was not out until 4 o'clock the following afternoon. Several reignitions occurred although the indications are that the Chief was ready to let the rest of the fire burn itself out but was persuaded to keep at work by the owners of the property.

The firm had a large amount of stock in the buildings. Figures on the loss are not yet available, but it was very substantial.

Owosso's Life Boat

AS A part of its first-aid equipment, the fire department of Owosso, Mich., has a life boat mounted on wheels and fitted with grappling irons and appliances for rescuing persons who may have fallen in the river, a pond or other body of water.

Memorial to San Francisco's Famous Woman Volunteer

ON October 8, 1933 the Coit Tower, a 181-foot concrete shaft on the top of Telegraph Hill in San Francisco, Calif., was erected. At the base of the monument was placed Knickerbocker Fire Engine No. 5.

The tower was erected with money left by Lily Hitchcock Coit, a famous character of San Francisco. For many years she was a member of Knickerbocker Fire Company No. 5 and answered every alarm. The story goes that Lily's first view of San Francisco when seven years old was a graphic lesson in the value of the fire department. The city had just been burned out and most of the citizens were living in tents. Much of her young life was spent around the San Francisco fire houses and she became as ardent a volunteer fireman as anyone in the city. She died in 1929 and her fireman's badge was buried with her.

The tower is probably the most beautiful fireman's memorial that has been erected in this country.

Grand Jury Acts To Protect Lives of Firemen

THE Grand Jury of Nassau County New York, asks volunteer fire departments to prohibit their apparatus from passing by red traffic light signals except when there is a fire. This is the result of the Grand Jury's investigation into the death of Milford Ottman, a fireman of Rockville Center, N. Y., in a collision between a fire engine and an automobile, the engine having passed a red light at a time when it was not going to a fire.

International

The trailer of this tank truck overturned and took fire when the truck skidded on the wet pavement of a Los Angeles suburb. Tank and trailer together contained 6205 gallons of gasoline. The potential hazard to any property near the burning wreck of a tank truck is shown by this picture.

Texas Volunteers Get a State Drillmaster

TO follow up the work of the school in the volunteer fire departments of the State, Director H. R. Brayton, Firemen's Training School, Agricultural and Mechanical College of Texas, announces the appointment of Chief Frank Williams of Winters as a special representative of the School. Chief Williams, who has had twenty-five years' fire department experience, and who has been through the chairs of the State Firemen's Association, serving last year as president of the organization, will contact the officials of the towns and villages of the state, selling them on the value of firemen's training work. He will also meet with the school officials of the various towns and offer his assistance in putting over fire prevention activity in the schools. Chief Williams will work with the volunteer fire departments, whose problems he thoroughly understands, and assist them in organizing a standard schedule of drills and classroom work.

They Let It Burn

WHEN members of the Dewey Heights District Fire Department were called out the morning of August 29 to fight a fire in a frame residence at 344 Williams Avenue, Luxemburg, Mo. a suburb of St. Louis, they refused to go into action and stood by as the house and contents went up in flames. The loss was estimated at $3,000. Harry Haeusser, chief of the fire department, said that the owner of the residence had failed to pay the annual assessment of $2 for the fire protection.

International

The smoke must be let out before the firemen can get in. This small store fire has been ventilated through show window transoms, and men have been sent over the roof to look for skylights and other openings which can be used.

Pointers on Ventilation

The Science of Getting the Smoke Out So That Firemen Can Get In

The Northwest Fire School held at Minneapolis, Minnesota, each year attracts large numbers of firemen from the departments, both paid and volunteer, in that part of the country. The following classification of fires and examples of the work of ventilation was prepared for this year's sessions of the schools by H. E. Jurgeson, Drillmaster, Minneapolis Fire Department.

VENTILATION, when applied to fire fighting means opening up a building to allow the heat, smoke and poisonous gases to escape. Firemen can then enter the building safely and reach the seat of the fire. Years ago firemen thought that to open up a building would spread the fire. This is, of course, true if it is not done properly. If the building is not ventilated, however, the hot gases will pack into every corner and may explode, thereby spreading the fire.

Ventilation does not mean that at every fire all the windows should be broken out or the roof and floors chopped up. Some judgment must be used.

Some general pointers on ventilation can be given but if large buildings are to be successfully opened up the firemen must know exactly how the building is arranged inside and therefore what ways there may be to let smoke and gases out. Such knowledge can only be satisfactorily acquired through the making of repeated inspections before the fire so that the firemen have the details of every building in which they may be called upon to fight a fire firmly in mind. There isn't space here to cover features of ventilation in all kinds of buildings but the general rules given here for the ventilation of dwellings and small stores will illustrate the principles. These are the commonest types of fires in all communities, large or small, in which ventilating operations must be performed.

For convenience in considering the problem of ventilation we will put fires into four classes, figuring the "class" by the amount of equipment needed to handle that fire.

Class 1 — Small fires that can be handled with a pail of water, small extinguisher or pump can.

Class 2 — A fire that requires a large chemical line, booster, or 1½-inch line.

Class 3 — A fire that can be handled with 2½-inch lines from the inside.

Class 4 — A fire which has progressed to control the building and on which outside lines must be used.

Class 1 fires can generally be ventilated by opening doors and windows without doing much damage. Fires in Classes 2 and 3 sometimes need a lot of ventilation. Class 4 fires need very little ventilation. Most of the time they are coming out of the roof when you arrive.

The question will be asked, "How can you tell what class of fire it is when you arrive and find the building fully charged with smoke?" You must size up the fire and make arrangements to have equipment for the next larger class of fire to back you up in case the fire turns out to be bigger than you have figured it. By that I mean that if you think it can be put out with a booster line you should have a big line ready in case it gets away.

Before any ventilation is done, your extinguishing equipment must be ready. Never open up until you have your hose lines ready to knock down the fire when it shows up.

When arriving at a house or building and finding it heavily charged with smoke, be careful in opening doors and windows. Protect yourself from a back-draft explosion. In opening a door after the lock has been sprung, stand to one side and push it open, then wait a minute to see if the smoke clears. If the smoke pours out for a time and then sucks back into the building, look out. You are likely to have a back-draft explosion.

A fire in a closed building uses up most of the air in a short time and as the air supply diminishes combustion is less and less complete. Incomplete combustion produces carbon monoxide and other gases which are highly flammable. These do not take fire at once because for the time being there isn't enough air to let them ignite. When doors or windows are opened in the process of ventilation, however, air is let in and this mixes with the flammable gases to form explosive mixtures. That's why back-draft explosions often follow ventilation.

Typical Fires in Dwellings

In an attic fire in a dwelling, first open up all dormer or attic windows. If this does not give relief enough, open up the roof at the highest point as nearly over the fire as possible. This point is generally where the shingles are smoking. In making a hole, cut along one rafter for about three feet, then skip one and cut on the inside of the next one. This makes cutting easy and repair work simple. After the cutting is done, begin at the top and pull off the boards. The smoke,

heat and fire are drawn up through the hole and firemen can then get in under the fire. If this pressure developed by the fire is not relieved, the fire will be driven down into the walls.

If there is no stairway or scuttle hole to get into the attic, a hole must be made. It is better to come up under the smoke with a hose line than it is to try to get in from the roof or use a line from the roof. When you have ventilated the attic, you can depend on it that the fire is going where you want it to and that its further spread may be controlled. With this in mind you can be getting your salvage covers in place below so that when you use water it will not do serious damage.

Where the fire may involve a corner bedroom, opening the windows on the two sides will make a cross draft which will usually draw the smoke out so that you can enter. When the fire is in a middle bedroom so that there is only one side from which ventilation can be done, the window or windows should be opened by raising the lower sash half way and lowering the upper sash half way. If the upper sash cannot be lowered, break the glass but raise the lower one with the glass intact. This allows the heat and smoke to go out the top and fresh air to rush in through the lower half through the normal circulation of air which will be set up.

With a kitchen fire the fire must be kept from spreading through the whole house. If it is a two-story house and the inside doors are left open the fire is sure to spread upstairs unless a line is placed to drive the fire back. If the outside door and windows are open you generally get enough relief.

International

The fire in this house was discovered in its early stages and response of the fire department was prompt, but lack of training and especially lack of knowledge of the principles of ventilation allowed the fire to get a disastrous hold and the house was practically wrecked in the process of putting out the fire.

Fires in basements are always bad fires to fight because you have to go down through the smoke and heat to get at them. In going down the stairs, back down, and if there is no air at the bottom you will be in a good position to make a hurried exit. In a house with a high foundation the windows on the side opposite to that which you wish to enter should be opened. This gives you a cross draft and relieves the smoke and pressure. If there are high partitions in the basement of course you will not get ventilation from a cross draft but in that case you will probably have to open up the floor above the fire. The pressure in the basement must be relieved or your fire will be driven up into the walls and then you will have a real fire on your hands. If there is a chance to get into one end of the basement shut down the lines at the other end so that they will not drive the smoke against the advancing men. The lines should be held there, however, in case they are needed.

If you should have a house that is built on a grade without many windows, you will have to cut holes bringing the smoke to the first floor where you can get rid of it. Opening the front and back doors of the house will produce a draft which will take most of the smoke out. If there is a hot air furnace in this house, the fresh air intake can usually be used for an opening by pushing down the pipe. Whenever an opening has been made, be sure to protect it so that the flames do not come through and spread the fire. Remember that if you can get to the seat of the fire without cutting holes or breaking windows, well and good, but do not wait until pressure has been built up and force the fire into partitions and spread the fire through the whole house.

Firemen must be thoroughly familiar with the inside arrangement of large buildings if ventilation is to be accomplished early enough in the fire to get the smoke out and let the firemen get right at the seat of the fire. Such knowledge can only be gained by inspection of the building before the fire.

Store Building Fires

Let us consider an ordinary store building in the middle of the block. Arriving at the scene of the fire, the building is found heavily charged with smoke. Go to the front and rear and open the doors. Be careful of a back-draft explosion. If after these have been opened you still can't get in, go to the

(Continued on last page)

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The Scope of Our New Section

Members of the Volunteer Firemen's Section of the National Fire Protection Association perhaps do not as yet realize the national and even international scope of this organization which they have joined. Letters with reference to the section have come into our Executive Office from every state in the Union and from every province of Canada. There appears to be an equal amount of interest in the section in such provinces as New Brunswick and British Columbia in Canada, and in such states as Rhode Island, Florida, Texas and Oregon. In one day's mail we received applications for membership in the section and subscriptions for VOLUNTEER FIREMEN from such widely separated organizations as the Blair, Nebraska Fire Department, the Texas City Volunteer Fire Department, Texas City, Texas, and the Vigilant Engine Hook and Ladder Company of Great Neck, Long Island, New York.

All classes of individuals in all kinds of communities are volunteer firemen. Regardless of class or community they all appear to be interested in learning more about the profession of fire fighting and improving the standing of volunteer firemen and volunteer fire departments.

A Lot for the Money

Our membership plan for the Volunteer Firemen's Section requires a minimum dues of ten dollars from a volunteer fire department before the department is eligible to membership in the section and the individual members of the department receive copies of VOLUNTEER FIREMEN. If we could place before the members of the volunteer fire department at one of its meetings a pile of the material that the department would receive in the course of a year for its ten dollars we think there is little question that every volunteer fire department would join the section. Twenty copies of VOLUNTEER FIREMEN are mailed every month to twenty individual volunteers in the department which total two hundred and forty copies of the magazine. The headquarters of the department receive four copies of the N.F.P.A. Quarterly, a magazine of one hundred pages each issue, a copy of the Proceedings running to four or five hundred pages, a copy of the monthly News Letters, posters, regulations, pamphlets, and educational material of every style and variety. The regular N.F.P.A. material, if kept at headquarters, becomes an invaluable reference library for every member of the department. We know and we feel that volunteer fire departments are beginning to realize that membership in the Volunteer Firemen's Section brings a lot for the money.

Coöperation of State Fire Marshals

The establishment of the Volunteer Firemen's Section of the National Fire Protection Association has met with a very enthusiastic response from the various state fire marshals in the United States and provincial fire marshals in Canada. Over a dozen of the fire marshals have offered every coöperation in the organization of the section and the securing of interest in their states or provinces. Letters to every volunteer fire department in their states have been sent out by State Fire Marshal Joyce of Maryland, State Fire Marshal Strohm of Iowa, and State Fire Marshal Butcher of Nebraska.

The state fire marshals realize the importance of the volunteer fire departments in the control of fire waste in their respective jurisdictions. State fire marshals also realize the helpfulness of the National Fire Protection Association because of their affiliation with the Association through the Fire Marshals Section. We believe that the development of our Volunteer Firemen's Section will bring greater coöperation than ever between the state fire marshals and the fire departments which will prove of mutual advantage.

Program of the Volunteer Firemen's Section

Since VOLUNTEER FIREMEN is going to several thousand new readers each month we restate here the program of the Volunteer Firemen's Section.

1. The interchange of experience among volunteer fire departments.

2. The development of a medium for broadcasting new developments and new ideas of benefit to volunteer fire departments.

3. The development of standard practices and methods for fire fighting by volunteer fire departments.

4. The promotion of fire prevention work in rural districts.

5. The promotion of the organization of new volunteer fire companies and extension of the service of existing companies where necessary.

Articles Contributed to *Volunteer Firemen*

It will be the policy of the editors of VOLUNTEER FIREMEN to encourage the contribution of articles for publication. Because it is a professional journal and not published for profit, it will not be possible to pay for these articles. We want to hear from readers, however, and receive as many suggestions as possible but must make an explanation in order to avoid disappointing authors whose material may not find immediate use.

Experienced men to write on volunteer fire department matters are not lacking. Contributions already received or material available in the editorial office is adequate to fill issues for sometime to come. It is the purpose of the editors to set a high standard for the quality of material published. One member, however, warns us not to be "highbrow." This we will try to avoid.

CLASSES OF MEMBERSHIP

National Fire Protection Association

Organization Membership

STATE and regional associations of volunteer firemen shall be eligible to organization membership in the National Fire Protection Association and entitled to six votes in the affairs of the Association and four sets of the publications which go regularly to N.F.P.A. members and members of the Volunteer Firemen's Section. — Dues $60 per year.

Membership for Individuals

Any volunteer fireman who so desires may apply for regular membership in the National Fire Protection Association. This entitles him to one vote in the affairs of the Association and a complete set of the publications which go regularly to N.F.P.A. members and members of the Volunteer Firemen's Section. — Dues $10 per year.

Volunteer Firemen's Section

An individual volunteer fireman shall be eligible to membership in the Volunteer Firemen's Section. He shall receive one copy of VOLUNTEER FIREMEN, the monthly journal of the Volunteer Firemen's Section, mailed regularly to his home address. — Dues 50 cents per year.

Because of the very low individual dues a minimum of 20 members from one department or fire company is required Membership may be applied for by one member of the company or department collecting 50 cents for each of the 20 or more members and making a single remittance for the group, or the company or department may vote to take out membership for its entire roster and make a single remittance from the company or department treasury. In either case the company or department itself is thereby made an eligible member of the National Fire Protection Association and entitled to one vote and full participation in the affairs of the Association. All the literature regularly issued to N.F.P.A. members is mailed to headquarters of the company or department.

The requirement of a minimum of 20 names may make some difficulty for the few departments whose rosters are less than 20. These may make special arrangements. They may send in the minimum remittance for 20 men at 50 cents each and divide this pro rata. This would add only a few cents per man. Another plan which could be worked out in most communities would be to get a number of citizens, interested, but not active members of the department to make up the required 20 for the sake of receiving the interesting material in VOLUNTEER FIREMEN.

Letters to the Editor

National Fire Protection Association,
Boston, Mass.

In compliance with your request of November 9, I am greatly pleased for the opportunity to enclose herewith a list of twenty names — members of our volunteer fire company, to receive the new N.F.P.A. monthly publication — VOLUNTEER FIREMEN as per plan outlined; and in this connection wish to state we are quite sure there has been a long felt need and also desire by volunteer firemen for such a Professional Journal, and being sponsored by N.F.P.A. it is coming from the proper source.

I heartily endorse the convictions and objects as set forth in "Editorial" (Vol. 1, No. 1) and feel that the aims of such a Volunteer Firemen's Section with N.F.P.A. as sponsor will be a *long* forward step toward helping volunteer firemen everywhere to become more interested as "Volunteers" — not only to be better "Fire Fighters," but also to be more interested in "Clean-Up" — "Inspection" — "Fire Prevention," etc. It will stimulate civic pride and create increased activities along these and other welfare lines in the community. Firemen will become *better* firemen. The result will be fewer fire losses everywhere. An endless number of benefits will be derived from this volunteer firemen's journal which could hardly be possible for all to receive in any other way.

I trust that volunteer firemen in every locality will avail themselves of this — the first opportunity, to my knowledge, that has ever been made possible to obtain such valuable information from a professional source at so nominal a cost.

The writer will be pleased to coöperate further for the cause, in any way possible.

Very truly yours,
FRANK ZELLER, Chief
Terra Alta Volunteer Fire Co.
Terra Alta, W. Va.

National Fire Protection Association,
Boston, Mass.

I wish to compliment you upon the fine appearance and arrangement of the second issue of the VOLUNTEER FIREMEN. I have read the issue from cover to cover and feel that a publication of this kind will be well received by the volunteer firemen throughout the country. This will be especially true in the rural sections and I am looking for great results from the undertaking.

Very truly yours,
DAVID J. PRICE
Principal Engineer in Charge,
Chemical Engineering Division,
U. S. Department of Agriculture,
Washington, D. C.

National Fire Protection Association,
Boston, Mass.

I have just returned from my vacation and found a copy of VOLUNTEER FIREMEN. I think the magazine a very good one and feeling as I do about fire protection and fire prevention believe it has a vast field in which to circulate. It is a good thing and something which is needed.

Sincerely yours,
WALTER C. RUNDIN, Chaplain,
Nebraska State Volunteer Firemen's
Association, Wahoo, Neb.

National Fire Protection Association,
Boston, Mass.

You will be interested to know that at the meeting of the Erie County Volunteer Firemen's Association at Kenmore, N. Y., a resolution was passed that we endorse the Volunteer Firemen's Section of the N.F.P.A. and bring the matter before our various member companies.

Sincerely yours,
EUGENE M. BRAUN,
Eggertsville, N. Y.

National Fire Protection Association,
Boston, Mass.

We herewith enclose list of members of the Haynesville Fire Department for which you are to send VOLUNTEER FIREMEN for the next twelve issues.

We want to commend the N.F.P.A. in this move as I have been on the Volunteer Department for some twelve or fifteen years and wondered why there was not some information that was applicable to the volunteer departments.

We realize that any department, whether paid or volunteer, has to read and study as we have many problems that confront us in fighting fires.

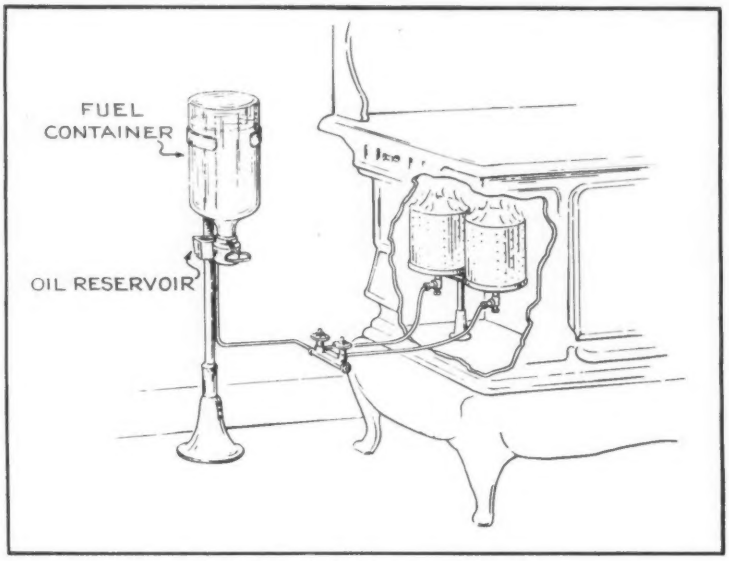
Yours very truly,
J. C. MCEACHERN, Chief,
Haynesville, La., Fire Department,
President, Southwestern Association
of Fire Chiefs.

National Fire Protection Association,
Boston, Mass.

I feel that VOLUNTEER FIREMEN is a worthwhile publication and hope that our fire departments over the state will take advantage of this opportunity of getting more information along fire protection and fire prevention lines.

I would appreciate it if you would put me on your mailing list for this publication as I feel that it will help us in this state in carrying out our state-wide training program.

Very truly yours,
H. R. BRAYTON, Director,
Firemen's Training School,
Agricultural and Mechanical College
of Texas.



Typical installation of a range oil burner.

Range Oil Burners

A New Hazard But One Which May Prove No Worse Than Old Wood or Coal-Burning Stoves

THE past two or three years have witnessed a rapid increase in the use of small oil burners designed for use in domestic stoves and ranges primarily intended for the use of solid fuels.

Range oil burners have been adapted to a variety of uses. For the most part they have been installed in cooking ranges and so-called "parlor" stoves originally intended for the use of coal in the residential sections of the smaller cities and towns and in rural districts. Range oil burners are also found in summer camps, detached garages, and in small mercantile establishments and shops.

The use of this type of burner in warm-air furnaces or steam or hot water boilers presents a marked increase in fire hazards in the opinion of the N.F.P.A. Flammable Liquids Committee and this committee has issued a warning in connection with such installations. Oil burners for installation in house heating furnaces or boilers must be of a type specifically approved for this use and range burners should not be so used.

The simplicity of the burner, its low cost and the ease with which it may be installed have helped to make it a "best seller." The complete unit consists of the burner, a fuel container and stand, and the essential piping and valves to connect the two. The fuel employed is kerosene or so-called "range oil" of 38 to 40 degrees Baumé Test and having a flash point of not less than 100 degrees Fahrenheit.

The burner itself consists of two central vaporizing chambers each surrounded by a series of perforated metal rings or cylinders in which the vapor is burned. The fuel container consists of a glass bottle or metal tank of from one to three gallons capacity supported on a metal stand in such a way as to maintain a definite oil level in a small chamber or reservoir. Fuel is fed by gravity from the fuel reservoir through manually operated valves to the vaporizing chambers of the burner. The height and adjustment of the reservoir on the stand in relation to the height of the burner determine the depth of oil in the burner. This adjustment is an important factor in preventing flooding and overflowing.

Five potential fire hazards are inherent with range oil burners and result from faulty installation, improper adjustment and operation, defective burners, careless handling of fuel and improper storage of fuel in dwellings.

A large number of fires have presumably been due to the installation or subsequent adjustment of burners by inexperienced workmen or home owners. Where burners of the proper type have been selected and properly installed by experienced mechanics, operating difficulties have been few and fires seldom reported. A vital feature is the proper adjustment of the oil reservoir, many fires due to overflowing or flooding of burners being chargeable in whole or in part to placing the oil reservoir level too high in relation to the burner.

The study of the causes of range burner fires indicates that the majority are the result of flooding due to faulty installation or adjustment. When flooding occurs prior to the lighting of the burner, the oil overflows from the vaporizing chambers into the ash pan of the stove and when the burner is lighted this free oil takes fire. This creates a smoke scare, may overheat the stove and smokepipe and, if dampers are wide open, may ignite sooty accumulations in the chimney. Usually little fire damage results.

Other fires involving the burners themselves and probably chargeable for the most part to improper adjustment or operation have been due to manipulation of valves while the burner is operating, to defects in the burner itself, to accumulations of excess deposits of carbon on the burner and to faulty dampers. Under no circumstances should dampers be permitted which may shut off the chimney vent.

Where lives have been lost in fires in connection with range oil burners carelessness in placing the bottle in position on the stand after filling has been usually responsible. In each instance the bottle has been dropped, the neck broken on the side or top of the stove and the oil ignited from the flame of the burner or the hot stove itself.

Improper methods of storage of oil in buildings used as dwellings involve a hazard that has given considerable concern to fire department officials. Storage in excess of ten gallons is usually in 50-gallon drums in the basement. These drums often are not provided with proper vents and may overflow when being filled. Oil is often spilled when the fuel container of the burner is filled from the drum and the so-called self-closing faucets sometimes leak.

The hazard of these burners is new in some respects. There is no evidence to show, however, that the hazard is of great seriousness except where attempts are made to use them in hot air furnaces. Their use removes two serious former hazards — hot ashes and starting coal fires with kerosene.

Statistics compiled by the N.F.P.A from partial records of the fires in which there was loss of life, 1930–1933:

Age and Sex of Victims of Fire

	Number	*Per Cent*
Men	2027	56.8
Women	632	17.7
Children	910	24.8
No Data	25	.7
Total	3594	100.0

Loss of Life in Dwellings, Apartments, Etc.

	Number	*Per Cent*
Men	507	29.2
Women	479	27.5
Children	738	42.4
No Data	16	.9
Total	1749	100.0

Loss of Life in Buildings Other Than Dwellings

	Number	*Per Cent*
Men	464	74.8
Women	85	13.7
Children	66	10.7
No Data	5	.8
Total	620	100.0

Loss of Life in Fires Outside of Buildings

	Number	*Per Cent*
Men	984	84.9
Women	67	5.7
Children	105	9.1
No Data	4	.3
Total	1160	100.0

Loss of Life Responding to Fire Alarms

	Number	*Per Cent*
Men	62	97.0
Women	1	1.5
Children	1	1.5
Total	64	100.0

Distribution of Casualties

	Per Cent
Dwellings, Apartments, etc.	48.4
Buildings Other Than Dwellings	17.3
Outside of Buildings	32.2
Responding to Alarms	1.8
No Data	.3
Total	100.0

Ruins of dance hall and garage in West Plains, Mo., where 38 people were killed and many injured in an explosion and fire.

Loss of Life from Fire

Three-Year Study by N.F.P.A. Shows Where Fire Deaths Occur—Rural Dwellings Lead

IF all of the people who are burned to death every year on this continent were burned at one time in one great fire, people generally would be shocked into realizing the terrific toll that fire takes in human suffering. Because loss of life from fire usually only takes one or a few people at a time and in widely separated places, the extent of this loss of life is not ordinarily recognized.

We are frequently asked as to the number of people burned to death annually and there is no entirely satisfactory answer to the question. It is practically impossible to arrive at an accurate figure because of the fact that death certificates ordinarily list the secondary cause of death, whereas the primary cause in many cases could be directly traced to a fire. When people are forced out of their homes in the middle of the night in freezing weather, contract pneumonia and die, the cause of death listed is pneumonia and not fire. The U. S. Census Bureau figures, for example, list loss of life from fire under "Conflagration — Burns" but experience in examining reports of losses of life from fire indicate to us that the total number of deaths for which fire is directly or indirectly responsible may be about 50 per cent greater than the number reported under the strict census classification. It is this experience which leads us to base our estimate of 10,000 persons burned to death yearly in the United States alone, which estimate we believe is conservative.

The National Fire Protection Association has been tabulating every reported loss of life from fire received from its members and other interested parties and it is the purpose of this article to present a tabulation of information over the past three-year period. These records, while representing only a fraction of the fires and loss of life that have occurred, probably not more than 10 per cent of the total, do furnish a sufficient amount of experience to permit the drawing of conclusions as to the conditions under which loss of life by fire has occurred and give some indication as to how such loss of life may be avoided by proper measures of fire prevention and fire protection.

The tables presented with this article give the essential statistical data on the material accumulated as a result of this study. They show the distribution of fatalities between men, women and children, where the fires occurred, and the causes of the loss of life in detail. It is easily seen that the major loss of life occurred in dwellings, particularly in rural dwellings. Large loss of life occurs in fires outside of buildings such as bonfires, forest fires, mine, automobile and airplane fires. The heavy loss of life in dwelling fires can be accounted for by

Where Loss of Life Occurred

	No. Fires	Men	Women	Children	No Data	Total
Fires in Buildings:						
Airports and hangars	6	8	0	0	0	8
Apartments, lodgings, tenements, etc.	154	150	69	66	7	292
Barns and stables	13	7	1	6	0	14
Buildings under construction	4	13	0	0	0	13
Churches	7	5	1	4	0	10
Dwellings — Rural	515	197	217	474	9	897
Dwellings — Urban	412	160	193	198	0	551
Fireworks and munitions plants	15	37	1	3	0	41
Gas works	3	17	0	0	0	17
Garages and filling stations	25	32	0	1	0	33
Grain elevators	7	15	0	0	0	15
Institutions, schools, etc.	34	89	51	2	4	146
Manufacturing occupancies	79	111	13	6	1	131
Mercantile occupancies	50	62	4	1	0	67
Motion picture theatres	4	6	0	0	0	6
Oil refineries	9	28	1	1	0	30
Other known buildings	49	34	13	42	0	89
Fires Outside of Buildings:						
Airplanes	113	208	17	6	0	231
Automobiles	133	148	42	23	4	217
Automobiles — Gasoline tank trucks	7	11	0	2	0	13
Forest or brush fires	18	29	0	4	0	33
Mining property	31	375	0	0	0	375
Oil or gas wells	12	39	0	4	0	43
Out-of-door fires (bonfires, etc.)	99	42	6	61	6	109
Railroad accidents	9	21	0	1	0	22
Ships and boats	35	45	2	4	0	51
Ships — Tankers and barges	7	66	0	0	0	66
Response to alarms	52	62	1	1	0	64
No data	8	10	0	0	0	10
Total	1910	2027	632	910	25	3594

combustible construction of dwellings, lack of local fire protection appliances, and the fact that many of these fires occur while the occupants are asleep. It is interesting to note that a larger loss of life apparently occurs in school and institution fires than in manufacturing occupancies. This may be explained by the generally inferior fire protection found in school and institution properties as compared with the protection of automatic sprinklers and other devices found in the average manufacturing plant.

The classification of causes of loss of life shows that the largest number of persons lost their lives when trapped in burning buildings. Deaths were put in this classification wherever it appeared that the victims were trapped in the buildings, due to lack of adequate exits, or other reason, irrespective of the initial cause of the fire. It will readily be noted that there are large losses of life in airplane and automobile fires. These classifications include only deaths strictly from fire and not due to other injuries such as from a crash. Most of the automobile fires were due to the trapping of the occupants in a wrecked machine and the ignition of gasoline released by the accident.

Fires in mining property take the greatest toll of life in fires outside of buildings. These casualties for census purposes would presumably be listed as mine accidents, but as those included in this analysis were all due to fire or to fire explosion it seems proper to include them in the tabulation.

That the loss of life from fireworks is relatively small is undoubtedly due to the "safe and sane" campaigns for their use in celebrations which have been persistently carried on over the past decade.

Children playing with matches caused 84 of the deaths. One woman listed under this classification was a mother who was fatally burned in an attempt to save her child from a fire he started while playing with matches. Most of these victims were very small children. It is noted also that a large number of children were burned to death while left alone for a short time. In many cases the reports indicated that in a very short time the fire gained such headway that when discovered it was impossible to enter the building to save the children.

Outstanding among the causes of fatal dwelling fires is the use of flammable liquids. Fifty-three persons were killed as a result of using gasoline to start fires in stoves. Some of these victims believed that they were using kerosene but others were ignorant or foolish enough to use gasoline deliber-

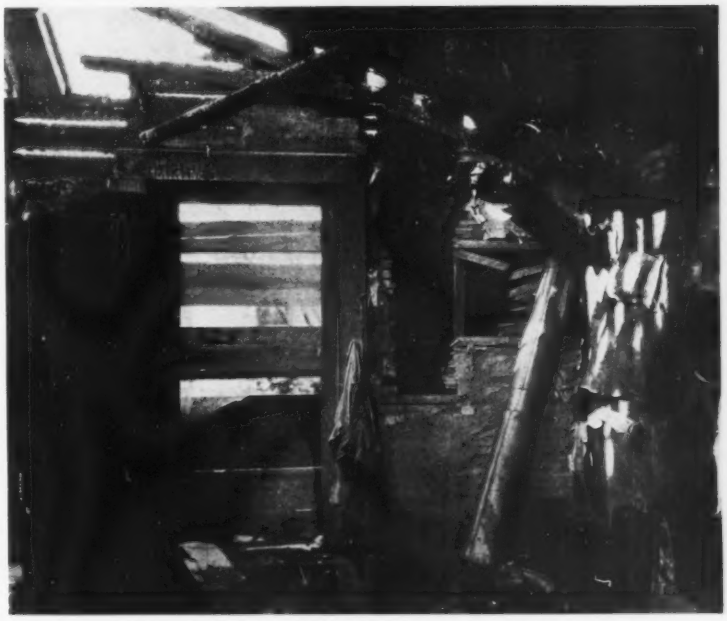
Fireman's Fund Record

Four children gazing sadly at the remains of the dress that their mother was cleaning. The gasoline she was using flashed into flames, igniting her clothing and causing her death.

ately. Kerosene used in a similar manner was responsible for 139 of the deaths. In some instances live coals remained in the stove and vaporized kerosene flashed or exploded. The use of flammable liquids for home dry cleaning was responsible for 44 of the deaths, mostly women, and again emphasizes the seriousness of this hazard.

Another outstanding cause of loss of life is listed as "Overcome by Smoke — Suffocation." One hundred and forty-eight persons lost their lives in this manner. In most instances the victims were overcome while asleep. Heat rising from a fire below often caused the death of victims who were not touched at all by fire.

It is hoped that the presentation of these statistics will be helpful to volunteer firemen in providing them with arguments for the better safeguarding of life in their own communities. A prime reason for establishing a volunteer fire department in any community is to safeguard the lives of its people and the figures presented in this statement emphasize only too clearly the vital need of fire prevention and fire protection measures.



The picture shows the defective flue which caused the fire in this Piqua, O., house in which three children, asleep, lost their lives. Three other children were rescued.

Direct Cause of the Loss of Life in Fires

	Men	*Women*	*Children*	*No Data*	*Total*
Airplane fires	208	17	6	0	231
Airplane, crashed on house	7	2	4	0	13
Automobile fires	147	42	23	4	216
Children alone in house	0	0	43	0	43
Children and matches	0	1	83	0	84
Cleaning with gasoline	9	33	2	0	44
Clothing ignited:					
Bonfire, campfire, rubbish	5	2	23	0	30
Candle or torch	3	2	1	0	6
Electrical appliances	1	3	4	0	8
Fireplace	4	10	12	0	26
Furnaces or stoves	10	53	24	0	87
Gas heater	3	4	5	0	12
Matches	0	6	1	0	7
Oil stove, lamp, or heater	7	16	10	0	33
Miscellaneous	10	3	5	0	18
Escaping from fire — drowned	4	0	3	0	7
Escaping from fire — jumped or fell	12	3	2	0	17
Explosion:					
Blasting or gun powder	10	1	6	0	17
Carbide or acetylene tank	3	0	1	0	4
Dust	7	0	0	0	7
Fireworks or munitions plant	12	1	4	0	17
Gas appliances	6	5	3	0	14
Gas well	6	0	0	0	6
Gas works	14	0	0	0	14
Gasoline lamps	0	0	3	0	3
Gasoline stove	6	7	15	6	34
Gasoline vapor	9	3	2	0	14
Gasoline vapor in boat	11	0	1	0	12
Illicit still	12	4	2	0	18
Illuminating gas	26	6	2	0	34
Incendiary origin	7	12	3	0	22
Mine	368	0	0	0	368
Oil field	22	0	0	0	22
Oil stove or lamp	13	21	17	0	51
Oil refinery	38	1	1	0	40
Powder mill	13	0	0	0	13
Tank steamer or barge	66	0	0	0	66
Miscellaneous	56	11	13	0	80
Unknown	5	0	0	0	5
Fire fighting	106	1	0	0	107
Fireworks	6	1	10	0	17
Flash from burning pyroxylin material	6	6	2	1	15
Forest or brush fire	18	0	4	0	22
Gasoline tank truck accidents	8	0	2	0	10
Gasoline used to start fire	12	16	25	0	53
Ignition of flammable liquids or vapors	85	20	33	0	138
Illuminating gas ignited	9	3	2	0	14
Kerosene used to start fire	34	47	58	0	139
Motion picture film ignited	4	3	0	0	7
Overcome by smoke — suffocation	70	40	38	0	148
Overexertion or excitement	16	4	0	0	20
Railroad accidents	11	0	0	0	11
Re-entering burning buildings	22	19	6	0	47
Response to alarms	59	5	1	0	65
Shock or after effects of fire	10	17	0	0	27
Smoking	39	12	0	0	51
Trapped in burning buildings	325	159	394	14	892
Trapped while starting incendiary fire	6	0	0	0	6
Miscellaneous known causes	23	0	1	0	24
Unknown	18	10	10	0	38
Total	2027	632	910	25	3594

Pointers on Ventilation

(Continued from page 5)

roof and see if there are any openings. If there is a skylight, open it. Most of the time skylights can be lifted off and tipped over. This saves breaking the glass. If there is an elevator shaft, open this up (be sure your elevator is below the floor where the fire is located). Remember again, if your fire shows up at one end of the building and your ventilating shaft is at the other, that lines must be used to stop the flames from traveling the length of the building. Protect exposures on the roof. If there are no openings on the roof, open the transom lights, the small windows above plate glass windows. These are close to the ceiling and will allow the heat and smoke to rise and escape so that you can get in under it and locate the fire. Be sure to get into the stores on each side to see if the fire has spread through at any point.

If the first floor is ventilated and no fire is found, the fire must be in the basement. The first move is to open all windows in front and rear. Then, is possible, crawl along the floor and try to locate the fire by finding a hot spot on the floor. Cut a hole here and use cellar nozzles. Sometimes it is impossible to get in very far. Then cut holes near the door. Protect holes which have been cut but are not being used by placing something over them.

You may find it possible to use the stairway to the second floor for ventilating. In many buildings this stairway offers a means of letting the smoke out from the basement as these stairways are usually directly over the basement stairs. Open the stairway door, if there is one, and if there is no skylight make an opening in the roof over the stairway.

If the fire should be in a loft of a building covering more than one store or flat, be sure to open up the roof as nearly over the fire as possible so as to keep the fire from spreading horizontally or being drawn down into party walls. In opening a roof or skylight to ventilate the floor below, be sure that the opening is made all the way through. In opening a roof, always keep your back to the wind.

The Indians years ago knew what ventilation meant. In their wigwams they had a fire in the center and had an opening directly above it with a windshield on it so that the wind would not drive the smoke down but suck it out. We haven't been as careful to provide natural ventilation for our modern buildings so ventilation is a real problem in fire fighting.

Regular N.F.P.A. Publications

Volunteer fire companies enrolling 20 or more members in the Volunteer Firemen's Section will receive at their home address each month a copy of **VOLUNTEER FIREMEN,** the professional journal of the section.

In addition the company itself will receive the publications described below which are regularly issued to members of the N.F.P.A. These contain valuable and authoritative material, including illustrated reports on important fires, the technique of fire fighting and fire prevention.

Quarterly Magazine. A chronicle of the Association's activities, with valuable articles covering a wide range of matters relating to fires. These are prepared by leading authorities and cover such subjects as municipal and rural fire departments, latest results of fire research, methods of dealing with special fire hazards, including flammables and explosives, and reports of conflagrations and interesting fires.

Proceedings of Annual Meeting. A stenographic record of the transactions of the Association and the discussions incident to the receipt of the reports of its technical committees and adoption of its standards.

News Letter. A monthly bulletin to inform members of the latest developments in the fire field. Many publications other than those of the Association are rendered available to members through this medium. (Twenty-two important publications last year.)

Year Book and Directory. Complete list of members with addresses. Arranged alphabetically and geographically.

Index to subjects covered in the Printed Records. (Proceedings, Quarterly, etc.)

Committee Reports. Thirty-seven technical committees make regular reports to the Association. These are printed and made available to members for discussion prior to their being adopted by the Association.

Special Bulletins. Numerous special bulletins are mailed to members from time to time. These cover a wide variety of topics. Typical subjects covered are successful fire prevention campaigns and special reports on major conflagrations.

Educational Material, Posters, Etc. Educational literature, posters and pamphlets for the use of members are prepared, including a special budget of material for Fire Prevention Week observances.

Special Information Service

Members are privileged to write the Executive Office for information on their special problems. Much material other than that published is thus made available to members from the extensive files and library built up over a period of 37 years.

Executive Office

NATIONAL FIRE PROTECTION ASSOCIATION

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